EXPEDITIONARY FIGHTING VEHICLE (EFV)

National Defense Industrial Association (NDIA) Combat Vehicle Division Conference

23 Oct 07

EFV MISSION

Provide High Speed Transport of Embarked Marine Infantry From Ships Located Beyond the Horizon to Inland Objectives

Provide Armor Protected Land Mobility and Direct Fire Support During Combat Operations

EFV

Revolutionizing Expeditionary Maneuver Warfare

Present: AAV

- WWII Doctrine
- No Standoff Distance for ATF
- Slow Speed Amphibious Assault
- 1960's Technology
- Limited Survivability

Future: EFV

- EFV directly supports the Marine Corps' Capstone Concept: Expeditionary Maneuver Warfare
- The EFV will provide the tactical mobility asset required to spearhead the EMW concept and permit the Marine Corps to fully exploit littoral areas as maneuver space
- The EFV will allow immediate, high speed maneuver of Marine infantry units as they emerge from ships located beyond the horizon (25 nm and beyond)
- The EFV's unique combination of offensive firepower, armor, NBC protection, and high speed mobility on land and sea represent major breakthroughs in the ability of Naval and Marine expeditionary forces to avoid an enemy's strength and exploit its weakness

Leap Ahead to 21st Century Technology

EFV

Mission Essential Functions

Move (Land)

Move (Water)

Shoot

Communicate

Carry

Protect

EFV - KEY PERFORMANCE PARAMETERS

CRITERIA	THRESHOLD	OBJECTIVE
• **High Water Speed -** 2'significant wave height, for not less than one continuous hour	**20 knots**	**25 knots**
• **Land Speed -** Forward speed on hard surface road	**69 kph**	**72 kph**
• **Firepower -** Maximum effective range Interoperability/standard ammunition with other service(s)	**1500m**	**2000m**
• **Armor Protection -** Any azimuth	**14.5mm/300m**	**30mm/1000m**
• **Reliability -** Mean Time Between Operational Mission Failure	**43.5 hrs**	**56 hrs**
• **Carrying Capacity**	**17 Marines**	**18 Marines**
• **Net Ready**	**100% of Critical *IERs**	**100% of Top Level *IERs**

***** Information Exchange Requirements (IERs)

Currently Demonstrated Plan to Demonstrate

PROGRAM STATUS

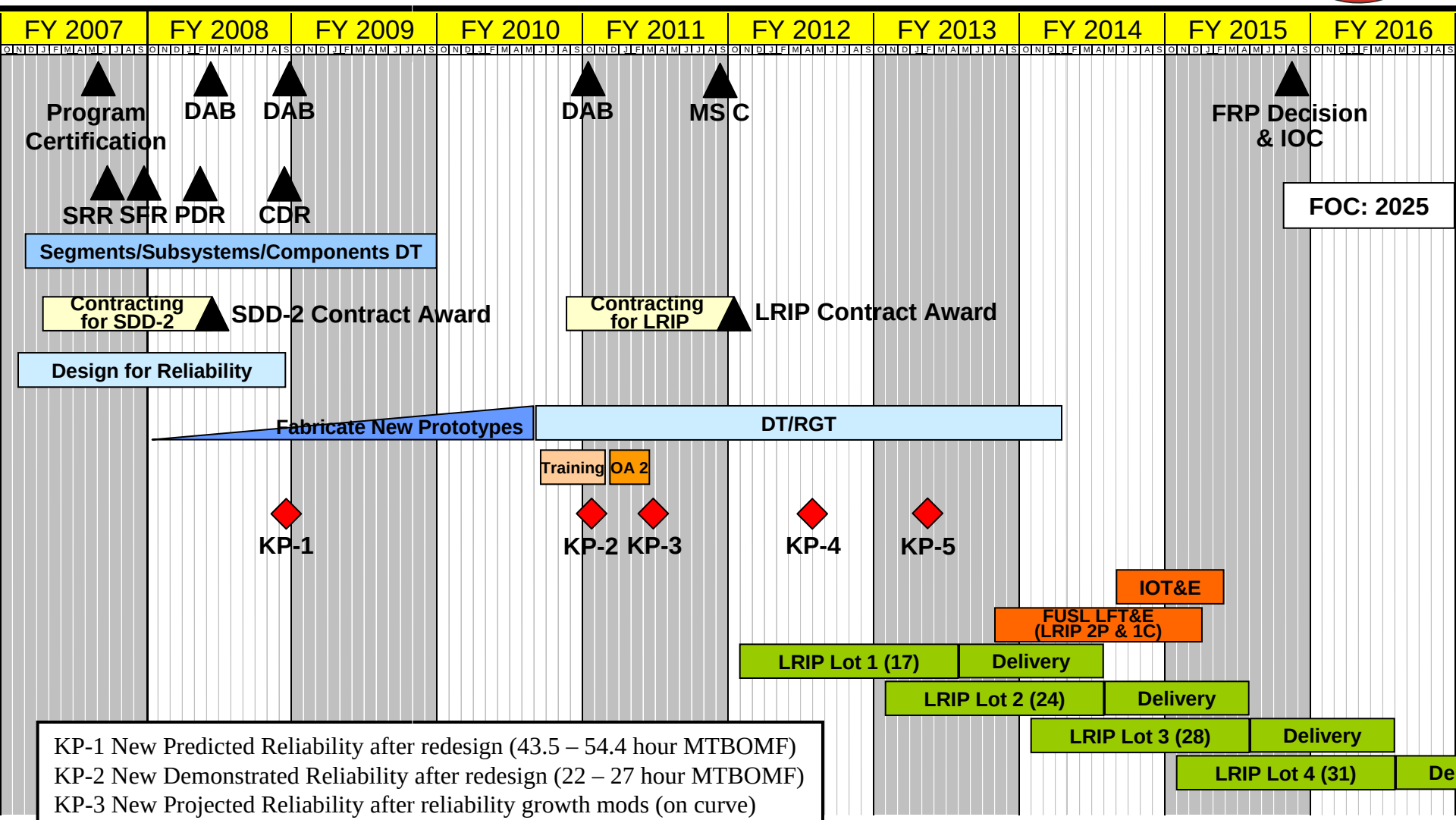
- **Critical Nunn-McCurdy Breach**
  - Based on PB08 submit
  - SECNAV determination/notification provided 6 Feb 07 (following PB08 submit)
  - Conducted comprehensive Reliability Design Review based on Fault Tree Analysis
    - **Determined reliability requirement is achievable**
    - **Analysis and results reviewed and confirmed by two independent teams**
      - OUSD (AT&L) SSE
      - PEO (Ground Combat Systems)
  - USD (AT&L) certified program to Congress 5 Jun 07
    - **Such Acquisition Program is essential to National Security**
    - **There are no alternatives to such acquisition program which will provide equal or greater military capability at less cost**
    - **The new estimates of the PAUC or APUC are reasonable**
    - **The management structure for the acquisition program is adequate to manage and control PAUC or APUC**
  - USD (AT&L) issued Acquisition Decision Memorandum (ADM) defining restructured program and additional oversight requirements

CERTIFIED PROGRAM STRUCTURE

- **Redesign for reliability**
  - Instituting robust systems engineering processes
  - Extensive segments/subsystems/components developmental testing
- **Build new prototypes**
  - Prototypes will be fabricated as parts “earn their way in” through the design release/verification process
- **Conduct extensive testing on new vehicles**
  - Developmental Testing and Reliability Growth Testing
  - Confirmation program is on reliability growth curve
  - Operational Assessment to support Milestone C

EFV PROGRAM STRUCTURE

13 August 2007



KP-1 New Predicted Reliability after redesign (43.5 – 54.4 hour MTBOMF)
KP-2 New Demonstrated Reliability after redesign (22 – 27 hour MTBOMF)
KP-3 New Projected Reliability after reliability growth mods (on curve)
KP-4 New Demonstrated Reliability after reliability growth mods (on curve)
KP-5 New Projected Reliability Meets KPP Requirement

GOALS

- **Reduce Vehicle Weight**
- **Reduce Vehicle Cost**
- **Improve Vehicle Performance**
- **Improve Vehicle Reliability, Availability, Maintainability, Durability (RAM-D)**
- **Introduce New Warfighting Capabilities**

OBJECTIVES

- **Emphasize near term technology, but anticipate for future upgrades through production and fielding. (policy)**
- **Reduce Vehicle Weight**
  - Lighter Weight Track
  - Lighter Weight Armor
  - Material Substitution
- **Reduce Vehicle Design-to-Production-Unit Cost (DTUPC) / Life Cycle Cost**
  - Identify Substitute Line Replaceable Units
  - Improve Manufacturing Processes
  - Improve Logistic Support Programs

OBJECTIVES

- **Improve Vehicle Performance**
  - Improve Power Transmission
  - Increase Armor Protection
- **Improve Vehicle RAM-D**
  - Corrosion Prevention
  - Robustness
- **Introduce New Warfighting Capabilities**
  - Wireless Technology
  - Advanced Displays
- **Introduce Design Enhancements**
  - Dissimilar Metal Avoidance
  - Modeling & Simulation of Battle Damage

CURRENT EFV 30X173MM AMMO

ATK
PGU-15/B TP

- AA65
- Free from Air Force
- Training round
- Ballistical matched to MK239

MK239 TP-T

- AA90
- $24.64
- Training round
- Ballistical matched to PGU-15

ATK
MK266 MOD1
HEI-T

- AA89
- $75.00 / $75.00, $150
- Linked one to one
- Infantry
- Light Fortified positions
- Light skin vehicles
- Light Armored vehicles

NAMMO-RAUFOSS
MK264 MOD0
MPLD-T

OERLIKON
MK268 MOD0
APFSDS-T

- AA72
- $271.00
- Light Fortified positions
- Light skin vehicles
- Light Armored vehicles
- Medium Armor

ATK HEAB

- B004
- TBD
- Covers all target sets minus Medium armor
- Current-$1400
- Production-$266

AMMO OPPORTUNITY VERSUS TARGET SET

Infantry

Lt. Fort. Pos/ Material

Unarm Veh/ Watercraft

Lt Armored Vehicles

IFV/BMP

HE

MPLD

APFSDS

Airburst

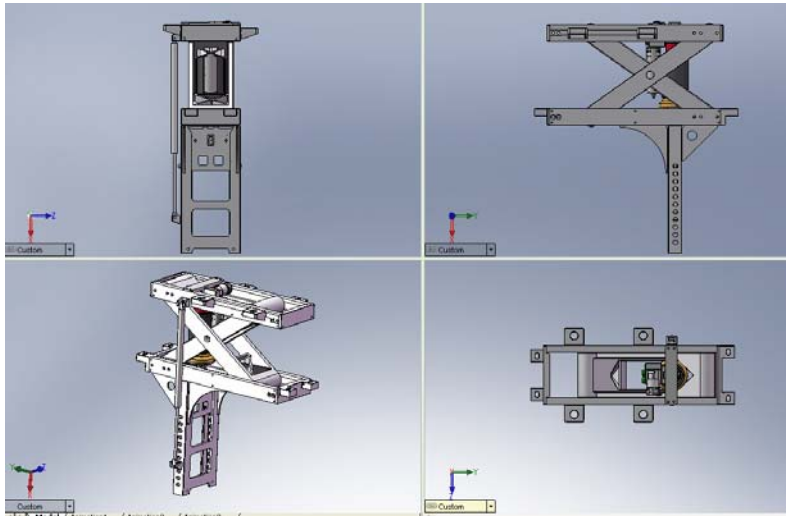
30MM AIR BURST MUNITION

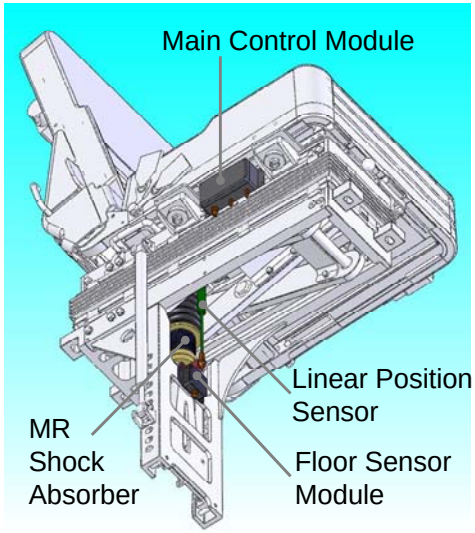
Down Select

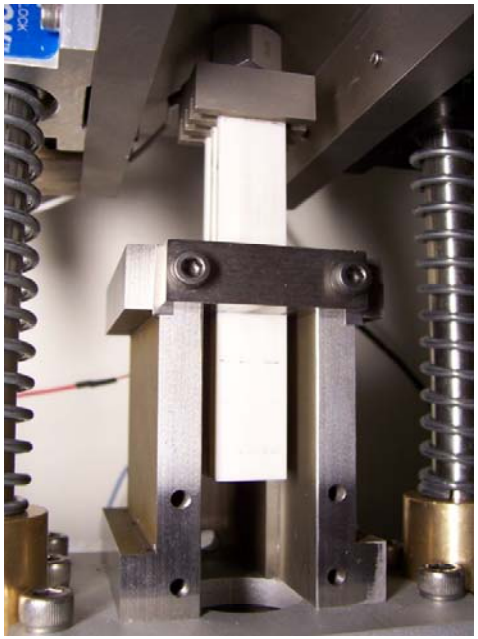
- **ATK/Diehl cartridge recommended by SSP for down select and qualification.**
- **General Information**
  - Warhead
    - **High Explosive Air Burst with Base Mounted Fuze**
    - **SAPHE Performance Against Materiel Targets (MK240 Hardened Nose Design from Diehl)**
    - **Explosive: PBXN-5**
    - **Incendiary: Zirconium**
    - **Inductive Fuze Setting in Gun Feed**
  - Cartridge
    - **Aluminum Case**
    - **Propellant: Single Base**
    - **Primer: M36A2 Percussion**
  - Fuze: Operates with or without the Inductive Fuze Setter
    - **Point Detonate Mode**
      - Default Fuze Configuration
      - Fuze Detonates Upon Target Impact
    - **Point Detonate Delay Mode**
      - Fuze Detects Impact with Target and Delays up to 1 ms before Detonating
      - Several Fixed Delays are Offered
    - **Air Burst Mode**
      - Fuze Detonates at User Programmed Distance
      - Fuze has Point Detonate Capability if impact with Target Occurs before Set Point
    - **Self-Destruct: Detonates at Maximum Mission Time**

ACTIVE INITIATIVES

- **Reduce vehicle vibration effects to crew/passengers**
  - Semi-active seat dampening







ACTIVE INITIATIVES

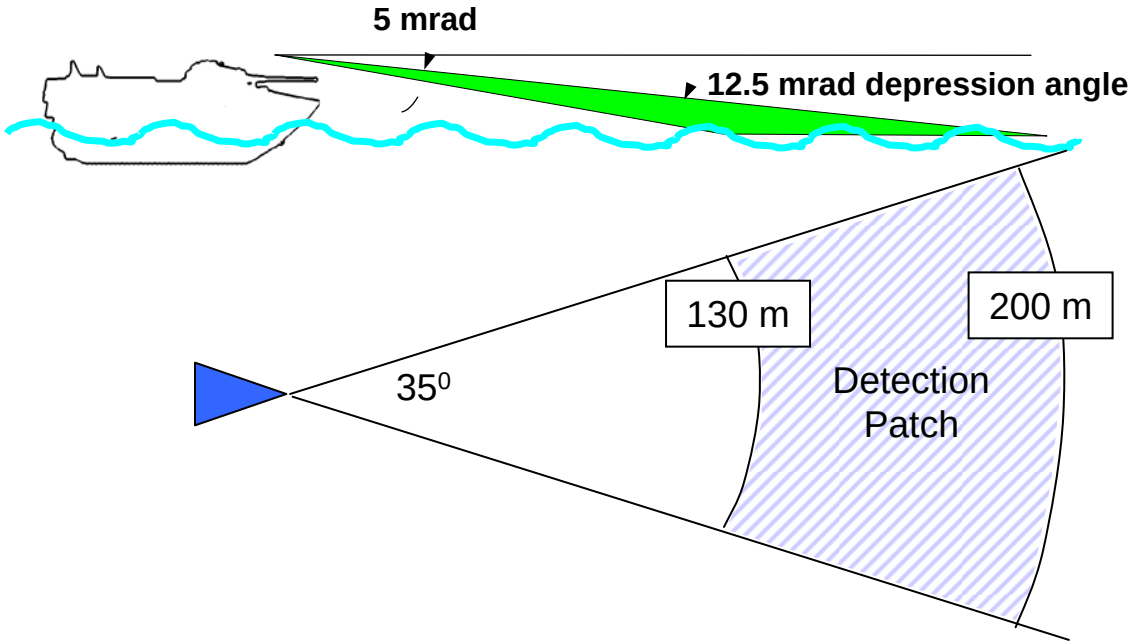
- **Low cost, high strength, lightweight materials**

Ti-6Al-4V Alloy Plate Castings

Actuator Mount Cap for the EFV cast using Metal Mold

ACTIVE INITIATIVES

- **Collision Avoidance System (Blue-Green Laser)**

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